

ON SCALE INSECTS (COCCIDÆ) &c. FROM THE
UGANDA PROTECTORATE.

By ROBERT NEWSTEAD, M.Sc., A.L.S., &c.,
The School of Tropical Medicine, The University, Liverpool.

THE following notes are based on a small collection of COCCIDÆ recently received by the Entomological Research Committee from Mr. C. C. Gowdey, the Government Entomologist in Uganda.

Stictococcus dimorphus, sp. n.

Adult female.—Hemispherical, with a distinct broad V-shaped depression on the dorsum immediately in front of the anal orifice; integument covered with short stout fulvescent spines, between which are one broad marginal and two subdorsal bands of white granular secretion; the secretory matter is, however, so much destroyed or hidden by a black fungus that it is impossible to ascertain definitely the exact course which it takes. The denuded integument is shining black. Venter with a large deep *marsupium* or circular orifice at the posterior extremity, occupying one-third of the ventral area; in many instances this was filled with larvæ. Antennæ short, of four segments, and about equal in length to the anterior femur. Marginal spines resembling those on the rest of the body, but set much more closely together. Legs short, but well developed; claw furnished with a long *ventral* digitule, which is slightly dilated anteriorly. Derm of venter with a few scattered spinnerets and also a few minute spines. Dorsal spines simple, about equal in length to the tibia, though a few examples near the margin are much longer. Anal orifice surrounded by a broad ring of chitin; upper operculum crescentic, bearing from 7-9 hairs; lower operculum with 4-6 hairs.

Diameter (greatest) 2.50-4 mm.

Larva of female (fig. 1).—Ovate, but gradually narrowed posteriorly. Anal orifice large; outer ring ovate, broad; upper operculum crescentic, with four large spinose hairs; lower operculum narrow, taking the contour of the outer ring of chitin, this bears two spinose hairs. Dorsal spines (fig. 1 *a*) in six rows, two submedian, two submarginal, and one marginal; those on the dorsum proper are uniform both in length and thickness and all are faintly serrate, the serrations widely separated, each tooth-like projection carrying a minute hair: the marginal spines vary considerably in length; some of those on the cephalic and thoracic segments being equal to, if not in some instances longer than, the entire length of the body, and there are at least four similar ones at the anal extremity; all these have the basal portions (fig. 1 *b*) faintly serrate

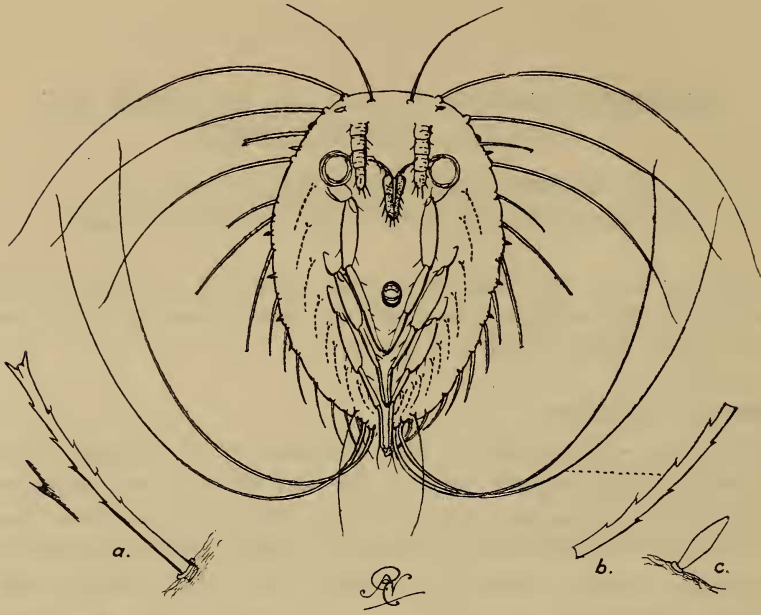


Fig. 1.—*Stictococcus dimorphus*, Newstead. Female larva.

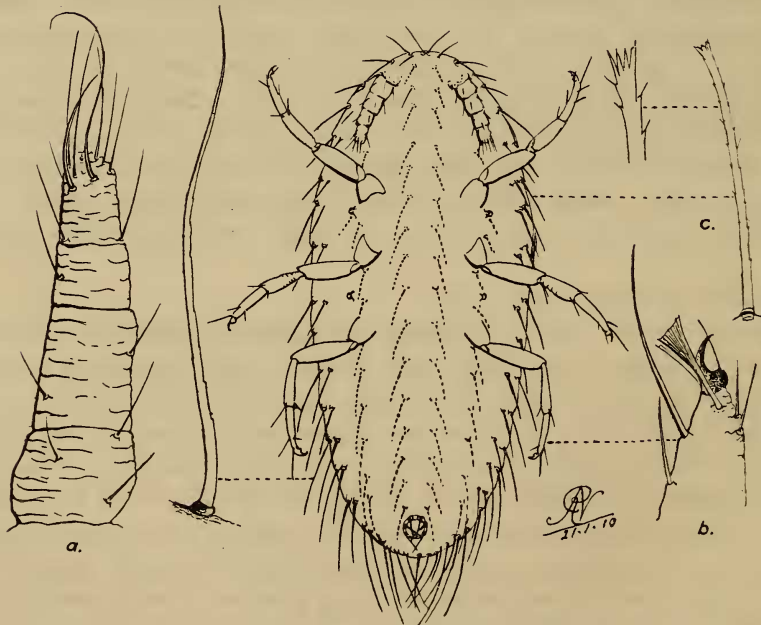


Fig. 2.—*Stictococcus dimorphus*, Newstead. Male larva.

as in the shorter spines, and all have immensely long filamentous ends, so that they may be more correctly described as *spinose* hairs; owing to the fine filamentous nature of the terminal portions of these appendages it is a somewhat difficult matter to determine their exact length, and some of them may be even longer than is shown in the accompanying figure. In addition to these there are also a few short lanceolate spines (fig. 1 *c*) irregularly interspersed between the longer appendages. Antennæ of four segments, the articulations of which are in most cases very faint; but they bear a close resemblance to those described herein as belonging to the male larva. Legs long, sparsely setose; tarsi as in the larva of the other sex (see fig. 2). Mentum biarticulate and finely setose; filaments of great length lie coiled on either side.

Larva of male (fig. 2).—Ellipsoidal. *Buccal organs obsolete*. Antennæ (fig. 2 *a*) of four segments, the third being slightly the longest; they are about equal in length to the tibio-tarsal segments together. Legs long, rather slender; ungues (fig. 2 *b*) with a strong bulbous base; lateral digitules spathulate and longitudinally striated; there is also a very long median dorsal spinose hair, and a shorter and finer ventral one; its basal or proximal portion resting apparently in the bulbous part of the claw. Dorsum with seven rows of long spinose hairs, all of them being finely but widely serrate; some of those at the margin (fig. 2 *c*) are shorter than the rest and have their apices slightly dilated and serrated as in the larva of the opposite sex. Anal orifice just within the posterior margin; this is more or less circular and is furnished with six long hairs, as in the DACTYLOPHINÆ.

GERMAN EAST AFRICA: Langenburg (*Dr. Fulleborn*; ex coll. Zoolog. Mus. Berlin). UGANDA PROTECTORATE (*C. C. Gowdey*, on Cacao pods, December 1909).

I am not in a position at the present moment to give any further details regarding the habitat of *Dr. Fulleborn's* specimens. I can only add that they were forwarded to me with other Coccids collected by him in German East Africa.

This remarkable species is nearly related to *Stictococcus multispinosus*, Newstead, but the adult female is easily distinguished from the latter by the *short stout and simple spines* which clothe both the dorsum and the margin, and the presence also of a large marsupial pouch on the venter, which latter was in some few instances found to be filled with the larvæ from which the diagnosis was drawn. The most remarkable feature of this species, however, is the very extraordinary dimorphism in the larvæ, the structural characters of the sexes being most markedly differentiated. I know of no similar instance of dimorphism in the larval stages of the COCCIDÆ, and I believe this to be an absolutely unique instance. As will be gathered from the diagnosis given above, I have described the mouthless form as that of the male, as the mouth-parts in the adult of this sex are invariably obsolete, and furthermore

because the anal orifice is placed near the end of the body and not "in the middle of the back" (*Cockerell*), as in all stages of the female in *S. sjöstedti*, the type of the genus, and as one finds also in the larva described as the female stage of *S. dimorphus*.

All the representatives of this genus are so far confined to the African continent. *S. sjöstedti*, *Cockerell*, and *S. formicarius*, *Newst.*, have a Western and South-western distribution, while *S. multispinosus*, *Newst.*, and *S. dimorphus*, *Newst.*, are from the Eastern side of the continent. The first and last named of these are of some economic importance as pests of the Cacao; but I have little or no information as to the exact nature of the injury caused by them to the plants which they infest. One may add, however, that a small cacao pod which was forwarded from Uganda was almost completely covered by the adult females of *S. dimorphus*, so that one may rightly assume that the fruit must have been injured by the insects to some extent. Unfortunately, the specimens arrived in very poor condition, and it is to be hoped that more perfect examples in all stages may be forthcoming. One looks forward also with no little interest to the discovery of the adult male and its puparium.

[When the cacao pod, sent home by Mr. Gowdey, reached England, two small cocoons were found on the paper in which it was wrapped. From one of these emerged a small Noctuid moth, which has been identified by Sir George Hampson as *Eublemma costimacula*, *Saalm.*, of the subfamily ERASTRINÆ. It is well known that some moths of this subfamily feed in the larval stage upon COCCIDÆ, and it seems highly probable that in this case the *Stictococcus* had served as the food of the larvæ. In view of the possibility that the Coccid may become a serious pest, the matter deserves further attention.—ED.]

Ceroplastes ceriferus, Anderson.

There is a slight tendency in these specimens to the formation of a short dorsal keel or ridge in the adult females as in *Ceroplastes egbarum*, *Ckll.* In one old adult example this character is well defined; in younger specimens it is absent. Unfortunately, one cannot say if this character is at all constant, as the series is much too small. In all other respects the examples are quite typical.

This insect may be distinguished at once from *Ceroplastes africanus*, *Green.*, by the presence of a long caudal or horn-like process at the posterior margin and the absence of a broad flat extension in front.

Mr. Gowdey states that in Uganda this species attacks Coffee, Cacao, Agave, Canna, Croton, Hibiscus, &c. On coffee it is said to occur in sufficiently large quantities to be of economic importance.

Ceroplastes ? n. sp.

The specimens being all immature females or early adults it is not possible to fix the species with any degree of accuracy. All the more so as the wax-like tests which cover the insects are all badly damaged. Gathering from what remains of these, however, I am inclined to think that this Coccid will eventually prove to be a new and undescribed one. The tests, so far as one can make them out, are star-shaped and very like a large example of *Vinsonia stellifera*. The derm of the young female becomes thin and transparent after maceration in potash, with a very small circle of brown chitin surrounding the short anal lobes. The antennæ are of six segments; the grouped stigmatic spines normal, and there is also a single large bluntly bidentate spine in the centre of the group.

Pulvinaria psidii, Maskell.

The specimens submitted for examination agree with the description given by Maskell *, with the exception of one rather important detail regarding the structure of the marginal spines. In the examples before me these organs are generally strongly curved, slightly flattened and deeply divided at the tips; in profile, however, they appear quite simple and the more or less forked character is rendered invisible. Cockerell † has noted a similar character, however, in some cotypes which he received from Maskell, but says that the spines are "broadened and serrate at the ends." There are no truly serrated marginal spines traceable in the African examples; but these appendages are for the most part broken away, so that one cannot clear up this slight discrepancy until a larger series of specimens is available.

There is also, so far at least as one can judge from the examples to hand, a difference in the disposition of the insects upon the leaves of the food-plant.

Maskell (*l. c.*) says that "the ovisacs cover the twig or leaf with masses of dirty-white cotton, usually accompanied by a black fungus." The African specimens are sparingly scattered over the under sides of the leaves and are generally isolated or widely separated.

It may be noteworthy from an economic standpoint to add that the examples are nearly all parasitized by a Chalcidid insect of some kind. The presence of these insects may, therefore, have reduced the colonies to such an extent as to prevent the overcrowding noted by Maskell in the examples sent to him by Mr. Koebele from the Sandwich Islands.

This Coccid has not hitherto been recorded from the African continent

* Trans. New Zeal. Inst. vol. xxv. p. 223 (1892).

† Bull. Dep. Agric. Ent. Tech. iv. p. 48 (1896).

but it has a wide geographical range elsewhere. Fernald gives New Zealand; Hawaiian Islands; Formosa; Ceylon; China; Japan; California.

The food-plants recorded are Citrus, Coffee, Tea, Guava, Cinchona, Pittosporum, &c.

Mr. C. C. Gowdey states that in Uganda this species is found in numbers on the native rubber-tree (*Funtumia elastica*), occurring usually on the upper surface of the leaves and along the principal veins.

Aspidiotus lataniæ, Signoret.

The dry puparia of this Coccid so closely resemble those of *Aspidiotus destructor*, Sign., that it is practically impossible to separate the two species or to gain any clue as to their specific identity. The females of the respective species are, however, easily separable by the character of the pygidia. In *A. destructor* the median lobes are narrower and shorter than the second pair, and the median pair of spines are twice the length of the former; whereas the median lobes in *A. lataniæ* are considerably larger than the second pair and the median spines are short. Both species also infest palms of various kinds as well as other plants. *A. destructor* has already been recorded from Africa (Leonardi) and I have recently received specimens from German East Africa through the Berlin Zoological Museum.

Hitherto *A. lataniæ* has not been recorded, so far as one can gather, from Africa, but this insect has a wide distribution and is a rather troublesome pest to cocoanut-palms in other countries. The examples sent by Mr. Gowdey from Uganda are also stated to be found on palms.

Aspidiotus cydoniæ, Comstock.

The examples are all females, a large percentage being immature or "second-stage." The circumgenital glands are rather fewer in number than has been hitherto observed; otherwise they are quite typical.

This is a widely distributed insect and also a general feeder, the principal plants attacked being Quince, Palms, *Citrus* spp., and Tea.

The Uganda specimens were also found on palms, apparently in company with the preceding species, with which they had been confused.

Puparia of a Species of PSYLLIDÆ infesting Orange.

It is not possible to determine this insect from the puparium only; but in all probability it will prove to be an undescribed species. The puparia so closely resemble those of certain kinds of *Aleurodes* that they were in the first instance referred to this genus. On a more careful examination of the integument small rudimentary wing-sheaths were found, the presence of

which precludes its admission to the ALEURODIDÆ. Of the specimens examined 95 per cent. were parasitized by a small Hymenopterous insect belonging to the CHALCIDIDÆ. This is evidently the insect referred to by Mr. Gowdey* as the "Pitted Scale," but it possesses no characters in common with the COCCIDÆ.

Efforts should be made to rear the adults, a comparatively easy matter if the puparia are collected when mature.

The pits or pseudo-galls produced by this insect are very characteristic, though it is well known that many species of PSYLLIDÆ produce galls and other malformations of the leaves which they are known to infest.

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* Colonial Reports : Uganda, No. 64, 1909, p. 22.